MONTANA OUTDOORS

Montana Mushrooms

MAY/JUNE, 1972

FIFTY CENTS

EDITORIAL CREED

To promote the preservation of a livable environment for wildlife, which is a quality environment for man

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MONTANA OUTDOORS

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THE COVER

The four front cover photos are from Jim Ford's collection of mushroom slides. For more on Montana mushrooms, turn to a special three-part feature on page 15.

On the back cover is "Old Crooked Horn," a famous ram in the bighorn sheep transplant in the Missouri River Breaks. According to photographer C. Robert Watts, the ram was legally taken by a hunter in the 1971-72 season. Turn to page 32 for more on the bighorn sheep in the Breaks.

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editorial

"A FEDERAL LAND USE FEE SHOULD BE CHARGED FOR HUNTING AND FISHING ON ALL PUBLIC LANDS OPEN TO SUCH USES"

So reads recommendation #65 made to President Nixon by the Public Land Law Review Commission (PLLRC) in its 342-page report, "One-Third of the Nation's Land." This report is generally excellent and sorely needed. However, I must take exception with this recommendation.

A coalition is now promoting action on this new license deal, and several bills have already been introduced to implement such a fee. I for one fear some support may come from those who misunderstand its effects on wildlife.

Many nonresident sportsmen who badmouth state restrictions on their activities champion the thought of a National Hunting and Fishing License.

The states, on the other hand, label it the "takeover movement" and "federal piracy" of the resident wildlife resource that has been entrusted to the states for wise management.

James White, director of the Wyoming Game and Fish Department, says, "If a national license and quota system is forced upon this state, (Wyoming), it would destroy hunting and fishing as we have known it by weakening or replacing time-proven management and regulatory methods . . ." And Harry R. Woodward, director of Colorado's Division of Game, Fish and Parks, says, " . . . One can only conclude that there is a strong movement to have the federal government take over licensing and management of fish and wildlife on public lands if not all lands in the nation."

White's and Woodward's opinions represent the general feelings of professionals from state conservation agencies, men who have spent their entire lives managing wildlife.

Should statutes follow recommendation #65, Montanans would be required to obtain a federal permit to hunt or fish on public land. Your land! Of course, that permit would be in addition to any required state license.

Under the present system, residents and nonresidents can cross and re-cross federal, state and private land in their outdoor activities with only one permit (issued by your Fish and Game Department) in their pockets. Should that be changed? I think not.

I believe a National Hunting and Fishing License would be a flagrant mockery of the established right of individual states to manage resident wildlife. (See M.O., Nov./Dec. 1970.) That right doesn't apply to migratory species such at waterfowl. Thus we have a federal "duck stamp." Should this coalition succeed, we would also have a federal "elk stamp," "moose stamp," "grouse stamp," "trout stamp," etc.

Does the responsibility for proper fish and game management go along with the federal permit? Or will the states still retain these duties?

The report is unclear on this point. However, it does state, "Administering agencies should institute positive programs to control hunter and fishermen density . . ." It goes on to say, "With permits, this type of control will be possible." Does Montana need this "type of control?"

This coalition should be stymied now. The crossfire of a Congressional debate could endanger what it was meant to save—the wildlife resources.

—Bill Schneider

The Missouri River Breaks (photo by Bob Cooney)

BY STEVE BAYLESS

THE BREAKS

From its headwaters near Three Forks, Mont. to its end near St. Louis, Mo., the Missouri River twists its tortuous way for some 2,500 miles. The river exists in an artificial state for almost all of its route. If Lewis and Clark made their epic voyage up the river today, they would find their way blocked by countless dams, irrigation diversions and bridges. Only one stretch of river resembles the Missouri of 1805.

The 150 miles of unaltered and free-flowing Missouri River between Fort Benton and the Fred Robinson Bridge represents the last of the "wild Missouri". Along this stretch of river, history comes alive with names like Pilot Rock, Hole-in-the-Wall, Deadman Rapids and Cow Island. But this heritage will disappear if federal plans for another dam on the Missouri become a reality.

In the early 1800's the upper Missouri provided the primary route to the vast, unexplored western territories. Many settlement and exploration sites still exist in unaltered settings along the river's course through the Missouri River Breaks. These sites reveal four stages of the nation's growth: the Lewis and Clark expedition, the early western fur trade, military and Indian affairs and the era of steamboat navigation.

Lewis and Clark visited the Missouri Breaks between May 24

GO SEE THEM, TAKE THE FAMILY, GO CAMPING, FLOAT THE RIVER, GO HUNTING, GO FISHING, ENJOY THEIR WILDERNESS QUALITY AND BE GLAD THEY ARE STILL THERE.

THE BREAKS continued

and June 10, 1805 and again the following year on Lewis' return trip. Thirteen identifiable Lewis and Clark campsites exist between James Kipp Recreation Area (near the Robinson Bridge) and Fort Benton.

Relics of early day Indian activity remain along this part of the river. Old campsites, burial sites and pishkuns (buffalo jumps) still remain in many places.

The first of the shallow-draft paddle-wheel steamboats arrived at Fort Benton in 1860. The settlement was the "end of the line" for river traffic and in one peak year, 1869, 39 steamers docked at the fort.

In addition to a bonanza for history buffs, the Missouri River and the surrounding Breaks offer a wide variety of outdoor recreation. Most lands bordering the river are federally owned, so the future is bright for public use and enjoyment.

The wild and remote character, the flora and fauna and the remarkable scenery of the Missouri and its Breaks beckons to people with aesthetic and wilderness values. Sportsmen venture into the Breaks and find exceptional hunting for mule and whitetail deer, elk, antelope, bighorn sheep, sage and sharptail grouse, pheasants, turkeys, ducks and geese. Mule deer thrive in the rough terrain which borders both sides of the river and whitetails abound on islands and along the river bottom.

Elk, present in the Breaks at the time of Lewis and Clark, survived only in the mountainous regions following settlement. During the early 1950's, ranchers and game biologists successfully transplanted Yellowstone elk into the Breaks. Elk hunters below the Robinson Bridge now enjoy some of the best success ratios in the state during the early fall archery season and the early winter permit season.

Lewis and Clark also recorded bighorn sheep sightings in the Breaks during their travels. The Audubon or native bighorn disappeared from the area in the

see related story, page 32

1880's. The Fish and Game Department re-established Rocky Mountain bighorns in the southern Breaks above the Robinson Bridge during the late 1950's. This population now provides limited hunting.

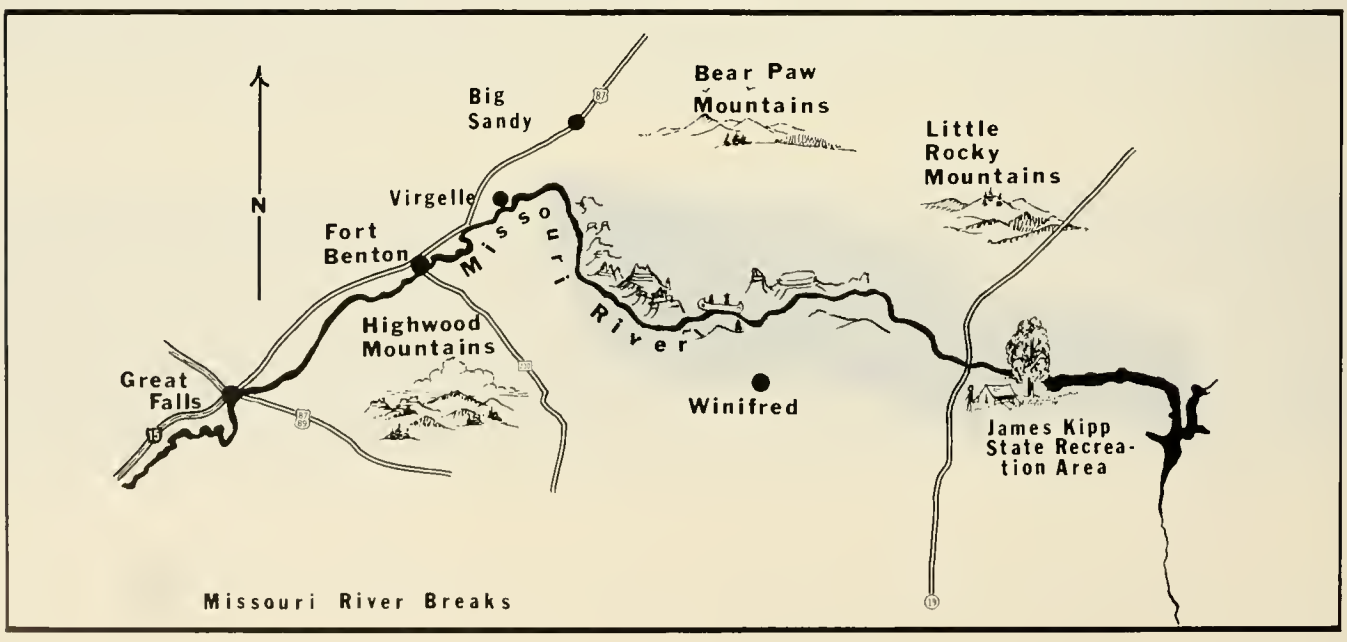
Grouse hunters find little competition and good shooting for sharptails and sage hens in the Breaks. A decrease in sagebrush habitat created a flurry several years ago, but the Bureau of Land Management ended sage eradication and quality bird hunting still continues.

The river and its islands provide secure nesting habitat for Canada geese and other waterfowl, and biologists report good production of geese each year. The river tends to concentrate large numbers of migrating geese, especially after northern waters freeze over.

The Missouri River also offers good fishing. The upper reaches of the stream near Fort Benton and Virgelle yield rainbow trout and sauger.

Downstream anglers take sauger, catfish, goldeye and northern pike. Set-lines provide the usual method of fishing the Missouri, but spinning outfits with bait or hardware also connect. Below the Robinson Bridge during May and June, snaggers take paddlefish which sometimes tip the scales at more than 100 pounds.

One of the most popular river uses involves floating downstream from Fort Benton or Coal Banks Landing Recreation Area, just downstream from Virgelle



to James Kipp Recreation Area at the Robinson Bridge. This trip provides a relaxing experience and gives the floater a look at near-pristine country. Lewis and Clark landmarks, native wildlife and few signs of civilization add to the land's remoteness and fragile beauty. Above lies Fort Benton, head of historic navigation. Below winds 150 miles of river, most accessible only by boat.

For over a decade, boondogglers have cast greedy eyes on the last section of free-flowing Missouri. Using power production, flood control and recreation as tangible benefits, private and federal development interests propose to dam the last vestige of natural Missouri in North America.

Plans call for an earthen monstrosity at Cow Creek, called High Cow Creek Dam, just above the headwaters of Fort Peck Reservoir. Should this pile of earth become a reality, Montanans can say "goodbye" to the scenic and historic values, wildlife habitat and river-type recreation. In place of these, a long, narrow reservoir will extend upstream past the mouth of the Marias River, nearly to Fort Benton. The situation in Montana will then be similar to the one in South Dakota where only 30 miles of free-flowing Missouri remains. That is hardly a bragging matter.

And High Cow Creek Dam could create a myriad of problems usually associated with large reservoirs — fluctuating water levels and associated fishery ills, a mud-flat environment during certain times of the year and game habitat litigation like the situation at Libby Dam. (Certain federal agencies have been asked to replace big game habitat lost to Lake Koocanusa.) But the loss of a unique natural river environment would overshadow all other consequences.

In 1964, the Montana Fish and Game Commission designated this stretch of the river as the Missouri River Recreational Waterway System under the State Park System. The conclusions of a cooperative Department of Interior-Department of Army study of the river were published about the same time.

The study presented 11 alternative plans for managing this stretch of the river, ranging from complete preservation to complete impoundment. Only two of these original plans survived. One provides for two dams and reservoirs to harness all of the river's remaining power potential. The other would place a large segment of the river under National Park Service management as a Lewis and Clark National Wilderness Waterway. This plan prohibits dams and includes the middle Missouri as a unit of the National Park System.

Another alternative was introduced by Senator Lee Metcalf (D-Mont.). His Senate Bill 4580 would make parts of the Missouri a wild, scenic or recreational river from Fort Benton to the Robinson Bridge. The proposal prohibits water impoundment or diversion on sections of the river deemed "wild" or "scenic," but evidently would allow water development on "recreational" sections. The proposal allows management of the area (similar to existing management) in accordance with the Taylor Grazing Act, the Multiple Use Act and the Wild and Scenic Rivers Act.

The Metcalf Bill preserves the river's wild nature and guarantees unhindered public use. Although the Montana Fish and Game Commission hasn't released a formal policy statement, Fish and Game personnel, including this author, favor Metcalf's bill or any other plan that will prevent destruction of the wild and free section of the Missouri.

As it stands right now, the river's "best chance" lies in its possible inclusion under the Wild and Scenic Rivers Act. This designation would ban dams and diversions, retaining the free-flowing nature. The act would allow grazing and similar uses much like the provisions in Metcalf's proposed legislation (i.e. those provisions now administered by the Bureau of Land Management.) Bureaucrats seem to favor this plan over Metcalf's bill.

History buffs also abhor the thought of an impoundment along this last wild stretch of the mighty Missouri. The 150-mile shoreline is dotted with historic sites, most of which honor the journey of Lewis and Clark. Fort Benton is listed on the National Register of Historic Places, and more sites will have that distinction in the next few years.

Listing a historic site on the National Register doesn't prevent impoundment. But it does stipulate that no federal agency can destroy the area without laboring through a series of reviews, boards and hearings to determine the best use of the site. Or, in short, it creates another stumbling block for developers.

What can you do to insure the future of this free-flowing river? Go see the area for yourself. Take the family, float the river and enjoy its wilderness quality. Write your congressman and let him know how you feel. "To dam or not to dam, that is the question." The ultimate fate of the wild Missouri rests in your hands.

EDITOR'S NOTE: Steve R. Bayless is the department's District Information Officer in Glasgow. The 32-year-old Kansas native has a Bachelor of Science degree in wildlife management from Utah State University, Logan, and a Master of Science degree in game management from Montana State University, Bozeman. Bayless has been with the department for seven years. He has served as Game Management Biologist in Havre and Information Assistant in Helena.

THE CATCHALL

notes and comment
by Bill Schneider

EDITOR'S NOTE—On March 9, 1971, the Governor signed the Montana Environmental Policy Act and created the 13-member Montana Environmental Quality Council.

The act stipulates that the council must "enrich the understanding of ecological systems" and make available "advice and information useful in restoring, maintaining and enhancing the quality of the environment."

From time to time, the council releases position papers to explain its philosophies. The following is an excerpt from the first of these papers. We thought it should be repeated here.

MONTANA ENVIRONMENTAL QUALITY COUNCIL POSITION PAPER NO. I

Adopted January 7, 1972

Endowed with abundant natural resources, Montana is perhaps the last great reserve of high-quality living space left in the contiguous 48 states. And living space may be our most valuable resource. Our priceless environmental heritage remains unblighted to a degree undreamed of elsewhere in this country.

Montana still possesses a quality of life which will be forever unattainable in other states ravaged by the destructive development of earlier eras.

We can still arrest Montana's localized environmental cancer and restore the health and productivity of the infected areas. Pollution has not yet become so pervasive in our state as to irreversibly impair the life-supporting natural systems which sustain human life and wildlife alike.

Health is the capacity for self-renewal. Montana still retains unimpaired this capacity for self-renewal of its natural communities of plants and animals. The natural systems of air, water and soil on which life depends remain essentially intact.

While the living ecosystems of the state still maintain their integrity, we can elect to harmoniously intermesh human technology with the systems of nature in a sustained and productive co-existence. Sustained economic productivity is dependent upon maintained environmental integrity.

People and corporations are going to discover this state. Quality attracts quality. Our efforts to maintain environmental quality will assure that we attract those people and corporations who will add most to the life of the state.

Montanans have both the ability and the determination to go beyond repair and restoration. We have a fleeting opportunity to *enhance* the livability of our environment.

We are now aware, as earlier generations in other places were not, of the interdependent links between a healthy natural environment and human well-being.

We have the knowledge. We have observed the pitfalls. We must accept the responsibility as trustees of the environment to assure its health and productivity for all Montanans, for all generations, for all time.

The effectiveness of the Environmental Quality Council in implementing the policy of the Montana Environmental Policy Act can be a decisive factor in shaping environmental quality.

Charlie Tuna Strikes Back

Could it be possible that Charlie Tuna has gotten revenge for all the scary stories about the mercury he contains?

Officials at the Union Chemical Company may think so.

It seems a company employe was eating a tuna fish sandwich near a 5,000-gallon shipment of ultra-pure mercury destined for

Next Time

Watch for these features in the July/August 1972 issue of MONTANA OUTDOORS

—Predator Calling
—Chief Joseph's Battleground
—Absaroka Primitive Area
—Terrariums
—Predator Control
—Irrigation and Dewatering
—Wilderness Classification for the Absaroka?

industrial use. He accidentally dropped his lunch in the tank car and contaminated the mercury.

A company spokesman said the mercury contained 0.5 parts per million tuna and was considered unfit for industrial use.

super mosquitoes?

Three California Mosquito Abatement Districts have announced that DDT and other insecticides are no longer controlling the insect. Officials said mosquitoes have already become resistant to DDT, toxaphene, parathion, methyl parathion and Baytex.

If Rachel Carson, author of *Silent Spring*, read this news she would probably say, "I told you so."

"Deadeye"

The carcass of an adult golden eagle was found near Casper, Wyo. with this sign, "To the continued safety of the flocks of Wyoming. For he dies that the lambs may grow."

The cardboard note was signed "Deadeye" and was accompanied with a drawing of an eye. The note was attached to the eagle's leg with barbwire.

Casper-area Game Warden Church Ward said the bird was shot at least twice and left along well-traveled Interstate 25, 12 miles north of Casper.

and a wolf came for breakfast

A Fort Frances, Ontario resident glanced out her living room window recently and didn't have trouble staying awake the rest of the morning.

A full-grown timber wolf was

proposed wilderness areas

The U.S. Forest Service has released a list of 18 areas that are under study for possible inclusion in the national wilderness preservation system.

The 18 tentative wilderness areas cover nearly 1.6 million acres of wild, roadless national forest land in Montana, northern Idaho and eastern Washington. The acreage summary includes 1,453,000 acres in Montana, 106,000 in Idaho and 21,000 in Washington.

Steve Yurich, northern region forester, announced the scheduling of public hearings on the proposed wild areas. Yurich said a thorough review will be made after hearings in each national forest containing one or more of the proposed wildernesses. Then, a list of suggested wild areas will be submitted to the Chief of Forest Service for approval.

Yurich asked that anyone wanting specific information on any of the areas contact the headquarters of the national forest in which the area is located.

SUMMARY OF TENTATIVE STUDY AREAS

Name of Area	National Forest(s)	Total Approximate Acreage	Remarks
Hilgard	Beaverhead & Gallatin	240,000	
Eagle Creek	Bitterroot	7,000	Addition to Selway-Bitterroot
Hoodoo	Clearwater & Lolo	160,000	
Salmo-Priest	Colville & Kaniksu	35,000	
Continental Divide	Flathead & Lewis & Clark	420,000	Addition to Bob Marshall
Swan-Bunker	Flathead & Lolo	65,000	Addition to Bob Marshall
Red Rocks	Beaverhead	5,000	
Italian Peak	Beaverhead	10,000	
West Big Hole	Beaverhead	50,000	
West Pintlar	Beaverhead	2,000	Addition to Anaconda-Pintlar
Pioneers	Beaverhead	150,000	
North Absaroka	Gallatin	290,000	
Arrastra-Stonewall	Helena	9,000	Addition to Scapegoat
Gates of the Mountains	Helena	6,000	Addition to Gates of the Mountains
Upper Beaver	Helena	16,000	
Silver King-Falls Creek	Helena & Lewis & Clark	25,000	Addition to Scapegoat
Scotchman Peak	Kootenai & Kaniksu	30,000	
Sun River	Lewis & Clark	60,000	Addition to Bob Marshall
	Total	1,580,000	

THE CATCHALL

eating suet out of her bird feeder. The feeder is a box-like affair on top of a four-foot-high cedar post and is only 20 inches from the window. Since then, the wolf has returned at least once more looking for more bird food.

whoopers winning their battle

The whooping crane, North America's largest bird, appears to be winning its legendary battle for survival.

In the 1940's, authorities estimated the world's whooper population at only 14. Since then, extensive conservation measures have allowed bird numbers to slowly climb. The most recent census found 60 whoopers in the wild.

Although it was never positively known how many of these large white cranes existed, it was thought they ranged over much of North America. When man started destroying the bird's life-giving habitat, the whooper was pushed to near extinction. Protection of the whooping crane's nesting grounds in northern Alberta and winter habitat in Texas has allowed numbers to increase to this extent.

Standing five feet tall with a crimson crown, the whooper is probably the most well-known of our endangered wildlife species. The bird has a ringing, bugle-like call and pure white plumage, except for black-tipped wings that spread more than seven feet.

crime and guns

Congressman Richard Shoup (R-Mont.) has introduced a bill that would change the emphasis of the 1968 Gun Control Law.

When he introduced the proposed legislation, Shoup charged that the present gun control act has failed to control crime. He said, "Registration of ammunition has proved to be nothing more than harrassment of honest sportsmen. Recent figures, after two years of the existing gun law, indicate there has been no reduction in the use of guns in crimes."

In general, Shoup's measure would change the scope of the law from registering guns to punishing the criminals who use them. The bill lists stiff sentences for anyone using a gun to commit a felony and removes any provisions of the 1968 act that requires registration of ammunition.

On Feb. 18, 1971, Donald M. Grover of Helena hooked this near-record brown trout below Canyon Ferry Dam. The lunker weighed 27 pounds, 15 ounces and was 34.8 inches long and 26 inches in girth. Although it's quite a catch, the brown trout falls short of the state record set in 1966 by E. H. Bacon of Three Forks. That fish, from Wade Lake, weighed 29 pounds. Carl Blankenship (right) assists Grover (left) in holding up the big trout. (F&G photo by Vern Craig)

duck stamp goes up

Waterfowl hunters can expect to pay an extra $2 for a "duck stamp" this fall. President Nixon has already signed into law a bill that allows the Secretary of the Interior to raise the license fee from $3 to $5. The Secretary is expected to do this sometime before July 1, 1972.

Funds from the sale of "duck stamps" are tagged for the acquisition of wetlands, a rapidly disappearing commodity. In fact, some officials predict that in another 10-20 years these prime wildlife areas will be priced out-of-reach of conservationists.

If license sales continue at the present rate, the fee hike will pour another $5 million into the wetland acquisition program.

MONTANA FLORA

AND WHAT IT MEANS TO WILDLIFE

Rabbitbrush

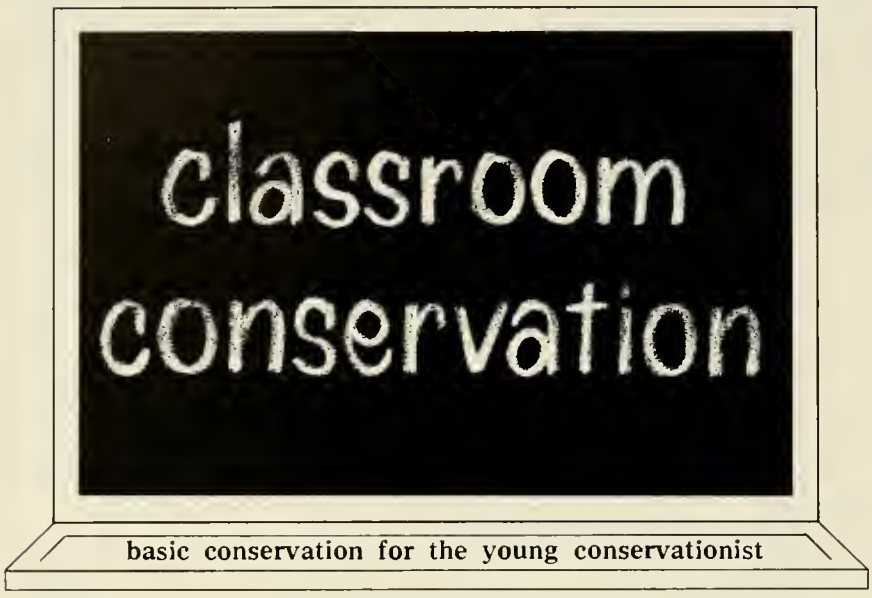
The presence of rabbitbrush on rangeland usually indicates poor land conditions from overgrazing or other abuse. Nevertheless, this shrub is a very important browse plant for wildlife in many areas of Montana. As you might expect from its name, rabbits feed on this plant but then, so do antelope, elk and deer.

Case In Point—Underharvested deer herds often build to a point where their winter forage is critically overused. Overbrowsed plants show up like chuck holes in Montana's streets as winter snows recede.

What To Do—Harvest more deer by sport hunting with liberal game seasons. The remaining deer will have a better chance of surviving severe winters.

Eventually, plants not killed by overbrowsing will recover their vigor and supply more forage per plant for deer. On improved ranges, rabbitbrush may be replaced by plants more preferred by deer.

—Harley Yeager



PREDATORS

—a cause of confusion—

Because predators* are sometimes vicious-looking with long teeth and claws and always kill other animals, many people think they are all "varmints" and should be shot on sight.

Bears, mountain lions, coyotes, foxes, eagles, hawks, owls, wolves and other meat-eating animals have been poisoned, trapped, shot and killed by every other possible method for many, many years. In fact, sometimes it seems the human race out-does itself thinking of new ways to wipe out predators.

The desired result of most "predator control" campaigns was the total extinction of that animal. And, unfortunately, many times it worked. Grizzly bears, mountain lions, wolves and wolverines have already been eliminated from areas where they formerly prospered.

But why are predators so unwanted? One reason is that predators are thought to severely limit other wildlife populations.

Back in the dark ages of wildlife management almost everyone (including fish and game departments) believed predators were an important limiting factor* on wildlife populations. Many early managers thought game management efforts were fruitless without an active predator control program.

Later, it was proven predators had value in the environment because they helped keep prey* animals balanced with the available habitat.* This balance is known as the carrying capacity* of the land.

When there are no predators, prey populations grow very rapidly and too many animals must compete for the inadequate habitat. For example, 500 pheasants might try to live in an area that only has enough food for 300. So 200 will have to go. Normally predators would have kept the pheasant population from getting too large. But man removed predation from the pheasant's life, so Mother Nature will have to reduce the population to the correct level—300. Most likely, she will do this by starvation, disease, malnutrition or severe winter weather.

Most people thought by eliminating predators they would, in turn, create a wildlife paradise where animals abounded without limit. Somehow the fact that predators are also wildlife was forgotten. But, nevertheless, this theory was tried several times and usually resulted in a too-many-animals-not-enough-food situation that had to be corrected by nature.

The management of the Kaibab National Forest in northern Arizona was a prime example. The sad consequences of the total protection of that local deer herd have already been featured in detail in MONTANA OUTDOORS. (Please see M.O. March/April 1971.)

In the Kaibab, 90,000 deer

DEFINITIONS*

predators—animals that kill and eat other animals.

limiting factor—a force that works to keep an animal population at or below a certain level.

habitat—a living area or "home" where all life essentials—food, water, cover and living space—are found.

prey—animals that are killed or eaten by other animals.

nest predators—predators that look for a nest and eat the eggs or young birds.

carrying capacity—the number of animals that a given area can support. If a wildlife population increases beyond this level a surplus is created and must be removed.

The coyote, a creature of controversy, probably has the worst reputation of all predators. Here, he's just a pup and not on the receiving end of any accusations. Later, when he matures, he will be condemned for killing game and domestic livestock. (F&G photo by Hector LaCasse)

pitifully perished from gnawing starvation because all predators (including man, the hunter) were kept from the overpopulated deer herd. On the way to mass starvation, these deer ate every particle of food. They went through their habitat like a giant vacuum cleaner and destroyed it. After the die-off, it took many years for the habitat and the deer population to recover. And when the herd finally stabilized, there were less deer than before predators were removed.

It has also been said that some predators kill "just for the sake of killing." Although a few meat-eaters do on rare occasions slay more than they can eat, most predators kill only what they need and return to or store their kill until it is completely consumed.

Hawks, owls, foxes, coyotes, weasels, eagles and other small predators feed mostly on prairie dogs, gophers, rabbits, rats, mice and other small mammals. When these meat-eating predators are killed, rodents and rabbits increase in number and sometimes cause damage to the farmer and rancher. Since predators help control these small animals, the meat-eaters shouldn't be killed.

In a few isolated situations, however, predators can harm wildlife populations. One example is in areas with a large concentration of nesting ducks and geese. Many nests in a small area make easy pickings for nest predators* such as skunks and raccoons.

The golden eagle, master of the art of winged predation, is rapidly disappearing from the Rocky Mountain West. (F&G photo by Gus Wolfe)

Another example is a small wildlife population struggling for survival. This happened recently in Oregon. Game officials transplanted a small antelope band into prime habitat and hoped for rapid population growth. However, the local coyotes saw the newcomers as easy prey and severely endangered the transplant's success. Officials undertook an extensive coyote control program and saved the antelope. Since then the herd has grown and established and coyote predation seems to have very little effect on its overall numbers.

The act of predation—one animal killing another—has caused all kinds of controversy. And, in the future, it will cause more. But regardless of what is said about predators, one fact remains. They are an essential part of the natural environment.

SUGGESTED PROJECT

Take any Montana predator and write a theme on it. Include such information as major prey animals, life history, economic value and best possible habitat.

a short story for those who DON'T anxiously await the first day of fishing season

by mary alice rothweiler

Opening day of another fishing season sometimes brings more gloom than glee from the fisherman's family. Days drag dismally for a mother trying to amuse the youngsters while Dad fishes "just one more hole," especially if she'd rather be fishing herself. The alternative, periodic desertion, is even less appealing. Fortunately, Montana's most favored fishing areas also offer great diversionary activities.

In eastern Montana the whole family can enjoy catching a paddlefish. The prehistoric fish has a long, paddle-shaped snout and is still caught in parts of the Missouri and the Yellowstone rivers.

Children might enjoy their early fishing experiences more if they used a stationary (set) line. Even adults are frustrated with unproductive casts. In set-line fishing, an angler can have up to six lines, with six hooks on each line. Most beginners will be satisfied with far less.

Regulations allow set-line fishing on the Clark's Fork of the Yellowstone River below Bridger, the Missouri River from the bridge at Cascade to Black Eagle Dam and below Morony Dam, Marias River, Big Horn River and portions of the Teton, Musselshell and Little Big Horn rivers. Check with the local game warden for exact locations.

While a night crawler on a hook entices fish in the Missouri near Fort Benton, take a tour of the town's historic museum. The

EDITOR'S NOTE: Mary Alice Rothweiler holds a Bachelor of Arts degree in international relations from the University of Colorado, Boulder. She has also done graduate work at Omaha University and Montana State University, Bozeman.

Crow Heritage Village north of Hardin is expected to open this spring. The village features a sweat tepee, Sun Dance Lodge, Vision Quest site and an island, lagoon and lodges. Fort Union and Fort Buford, restored Army and trading posts on the Montana-North Dakota border, also lure history buffs.

Or try fossil hunting in eroded areas along Fort Peck Reservoir. Get permission from private or public land owners and don't try the sport unless someone in your group is experienced. These large, undeveloped fossil grounds shouldn't be spoiled through ignorance.

Few families return from a trip without a good assortment of interesting rocks. Precious and semi-precious stones abound in Montana. With some information on where and how to find them, rock hounds can collect rubies, sapphires, garnets and amethysts along many of the western streams. Yogo Gulch near Lewistown yields sapphires of gem quality. Montana moss agates can be found in the Yellowstone River gravel from Livingston to Sidney.

Informed sportsmen can hunt mushrooms near most fishing areas. Mushroom fanciers guard their secret hunting places as closely as fishermen do their favorite holes. The highly prized morels begin to appear at the start of fishing season and can provide wonderful go-together eating for those who get both fish and fungi.

State fish hatcheries also welcome visitors. Fisheries personnel are usually on hand to explain the hatchery programs. Dark clouds of fish darting from one end of the tank to the other can keep youngsters spellbound for hours. Giant Springs hatchery near Great Falls attracts thousands of families each year. Picnic grounds and excellent fishing sites enhance the Spring Creek hatchery at Lewistown.

The Fish and Game Department is the official recreation agency for the state and is responsible for the state parks system (state monuments, fishing access sites, state parks, recreation areas and historic sites.) Take time to learn the regulations enforced in these areas. Some may surprise even seasoned recreationists. For example, section 1, article 11 of the regulations prohibits digging for worms in recreation areas.

Many public and private agencies have information on area points of interest. Research local activities on your next fishing trip. Maybe the fisherman in the family will be so interested he'll take the children, and Mother can have a quiet afternoon alone, fishing.

FOR MORE INFORMATION

topic	address
Lists of sites and facilities, "Regulations Governing Public Use of State Parks and Recreation Areas," Fee schedules, "Montana State Parks," "Along Montana Highways," "Popular Float Streams," Vacation booklets.	Fish and Game Department (either the state office or respective districts) or Department of Highways Advertising Unit Helena, Mont. 59601
Wilderness trips	Montana Wilderness Association Cecil Garland, President Lincoln, Mont. 59639
Montana vacation events	Montana Chamber of Commerce Box 1730 Helena, Mont. 59601 or local Chamber of Commerce
Montana rocks	Butte Chamber of Commerce Butte, Mont. 59701 or Bureau of Mines Butte, Mont. 59701
Room to Roam (a recreation guide to the public lands)	Superintendent of Documents U.S. Government Printing Office Washington, D.C. 20402 (50¢)

book reviews

THE NATIONAL RIFLE ASSOCIATION CONSERVATION ACTION HANDBOOK, Creative Printing, Inc., Hyattsville, Maryland, 1969, softback, $3.50.

The Conservation Action Handbook tells the average sportsman how to channel his conservation efforts to make them more effective. Sportsmen interested in the future of outdoor recreation should read the booklet.

The authors discuss the importance of hunting in the conservation of game animals and the fallacy of artificial stocking. One section deals with multiple land uses, zoning and land use planning.

The book covers the various sources of pollution and other environment degradation, but calls public apathy the greatest challenge. It also elaborates on man living in harmony with his environment and suggests individual and group action to combat resource use ills.

The booklet offers some good advice for those who want to do their part in the conservation movement. In addition, appendices at the back of the book include much useful information —like lists of natural resource management agencies, congressional committees which consider legislation and references for additional reading. — *Steve Bayless*

WILDERNESS: THE EDGE OF KNOWLEDGE edited by Maxine McCloskey, Sierra Club, San Francisco, 303 pages, $6.50.

Wilderness: The Edge of Knowledge is based on the presentations at the 11th Biennial Wilderness Conference held March 14 and 15, 1969.

The list of contributors is impressive and spans a wide range of outdoor interests. A quote by Thoreau opens the body of the book——"There are a thousand hacking at the branches of evil to one who is striking at the root."

The book is an effort to focus on the root of the threats to the idea of wilderness. Maxine McCloskey deserves applause for minimizing the boredom potential inherent in any large conference.—*Bob Carroll*

THE ENVIRONMENTAL REVOLUTION by Max Nicholson, McGraw-Hill, 366 pages, $10.00.

The Environmental Revolution gets down to the nitty gritty of man and his world-wide environment. It is a fresh, disturbing and stimulating view of the human species at this point in time, but not without optimism.

Nicholson suggests that before straying away to other planets, we learn the facts of life and discover who we are through our actions on this planet.

This is one of the better big-picture presentations available, and would be of particular value to those who would like to know something about what an environment is all about.—*Bob Carroll*

HOW TO ATTRACT, HOUSE AND FEED BIRDS by Walter E. Schutz, revised edition of **BIRD WATCHING, HOUSING AND FEEDING,** Bruce Publishing Co., New York, 195 pages, $7.95.

The author has covered the subject of birding well, but *How to Attract, House and Feed Birds* seems to be slanted towards readers in the eastern and central states.

The book begins with a chapter on ecology and the inter-relation of man, birds and the environment. The economic value of even the most common birds is stressed, using detailed lists of animal and vegetable foods the birds eat.

Schutz breaks the requirements of birds into three catagories: food, water and shelter. Food is the most important and continual summer and winter feeding is stressed. The book also includes methods of feeding and recipes for suet cakes and peanut butter and suet mixtures.

Different kinds of bird baths are illustrated and a good discussion of bird houses has been included. There are descriptions, line drawings and photographs of many practical bird houses.

Long lists of reference books, guides and aids to bird identification are given. A section is devoted to identification and another to trees and shrubs that attract birds but many species discussed can't be found in the West.

The book would have to be considered an accurate account of birding, but it is slanted towards the eastern reader.—*Louis M. Moos*

LIVING WATER by Ernest Braun and David Cavagnaro, American West Publishing Co., 183 pages, $13.95.

Living Water is a living book. The perfect blend of fantastic photography and flowing text captures the imagination and swirls it along with the water itself.

Living Water traces moisture in the atmosphere, onto the land, down the watershed, into the sea and back to the atmosphere.

Some books you read, others are more to be endured and still others are fascinating. *Living Water* is fascinating. It envelops the reader and carries him along.

Indispensible to the outdoor enthusiast and revealing new worlds to the megalopolis dweller, *Living Water* should be in everyone's library.—*Bob Carroll*

COMPLETE BOOK OF THE BOW AND ARROW by G. Howard Gillelan, Stackpole Books, Harrisburg, Pa., 1971, 320 pages, no price listed.

All that man knows about archery is very capably summarized by G. Howard Gillelan in his *Complete Book of the Bow and Arrow.*

Dr. Saxton Pope, a devoted student of archery, concluded that bow shooting has been a way of life among men for 50,000 years. The most noted of the pre-Christian archers was the Egyptians. And, the ancient Chinese used archery as a weapon of war. Today archery is becoming more popular and has now been included in the Olympic Games.

The exhaustive text of this book covers target archery, field archery, bow hunting and bow fishing. It includes the needs of the beginners as well as the experts. Bows and arrows for the beginner, stance, nocking, drawing, release and follow-through are clearly explained. For the archer whose skill and dedication is outstanding, there is guidance for tournament and income-producing opportunities as well as information on careers in archery.

Hunting attracts more archers than any other branch of bow shooting. Pennsylvania annually fields about 150,000 bow hunters. If you are just getting started in archery, you will find bow hunting, from a recreational viewpoint, a very rewarding sport.

For the beginner who wants to learn the sport or for the hardened archer who wants to improve his skill, the voice of experience in this book tells how to do it.—*Gene Sherman*

THE COVER STORY

To Hunt The Wild Mushroom

By Cecelia Wittmayer and Roger Fliger

Mushroom hunting is a sure route to gastric delight and excellent outdoor recreation. This famous fungi grows throughout Montana and, with the exception of posted private land, is yours for the picking. Your first trip to the forest or field may be the beginning of a new family hobby and a series of more savory suppers.

Mushrooms belong to the group of plants known as fungi and get their name from the French word, *moussu*, because many edible species grow in deep, mossy woods. They contain no chlorophyll and therefore can't make their own food by photosynthesis. The 3,000 mushroom species fall into two general classes of fungi—parasites and saprophytes. The parasitic mushrooms that subsist on living trees are called lignicolons. Terrestrial mushrooms (saprophytes) live on fallen leaves or needles on the forest floor or on the remains of herbacious plants. They may also form a symbiotic (two plants living in close relation with each other and the relationship not harming either plant) relationship with the roots of trees.

growth cycle

The fruit-body of a mature mushroom produces spores (microscopic reproductive organs, similar to seeds) that are carried by the wind or animals. When transported to a fertile site, they germinate and produce threads of hyphae. These threads develop into a mass called a mycelium or spawn. This vegetative section of the mushroom digests the plant's food. The button or immature mushroom sprouts from this spawn and ripens into the mature mushroom or fruit-body.

In the common gill-like mushroom, such as the meadow mushroom, spores develop into mycelium during warm (40-60° F) rainy periods. The button stage of the mushroom has a cap and stem (see drawing page 16). As the plant matures, the cap will unfold into the umbrella form and gills will be revealed on the underside of the cap, like spokes on a wheel. The gills are protected by a white membrane, the partial veil, in the immature stages. The veil breaks as the plant matures and hangs on the stem as a ring. The gills are the reproductive section of the mushroom and will release spores when the plant matures.

Some species are enveloped in a wrapper called the universal veil or volva when the plant is still underground. As the button grows, the veil breaks and frequently leaves part of the wrapper in the soil as a cup, part on the stem as rings and part on the cap as "warts."

mushroom hunting

Whether the outdoorsman enjoys a casual interest in the fungi or becomes a fanatic "pot-hunter," mushroom hunting offers an interesting family sport.

The mushroom hunter must remember, however, that luck plays an important part in his search. Some fungi have specialized habitats and will grow only in these areas. Certain temperatures and humidity conditions must be present for other species to thrive.

And some simple rules must also be remembered. If possible, go with an experienced hunter the first few times and *take along several mushroom books for cross reference.* Work with one species at a time, beginning with the more common mushrooms and wrap each plant separately in tissue or wax paper. Don't use plastic bags or plastic wrap because this often hastens deterioration. Collect only larvae-free specimens. (An insect-infested plant will have pinholes in its flesh.) Jot down details of the find, including a description of nearby plant life, to aid later identification. Try to get an old and a young specimen to compare and always dig down and get the base of the plant for identification help. Don't pick more than you need and *never assume your identification is correct if details don't completely check with your guide books.* Eat only typical specimens.

After you get home, make drawings of the plant and check its cross-section, especially if it is

to be eaten. A small puffball could be mistaken for a button-stage poisonous mushroom so be sure to take this precaution. Check the wrapping paper for spores and make a spore print, an excellent method of identification for the beginner. (Cut the cap from the stem and place it gill-down on a piece of white, porous paper. In several hours the spores will be deposited on the paper. Record the arrangement and color of the spores.)

Before eating a new species of mushroom, cook and taste a small portion. Each member of the party should make his own taste-test since some people are allergic to any mushroom. Cook each species separately and eat only one species at a sitting. Different species have distinct tastes that can't be enjoyed if their flavor is drowned by another mushroom. And, too, the responsible species will be pinpointed should a reaction occur.

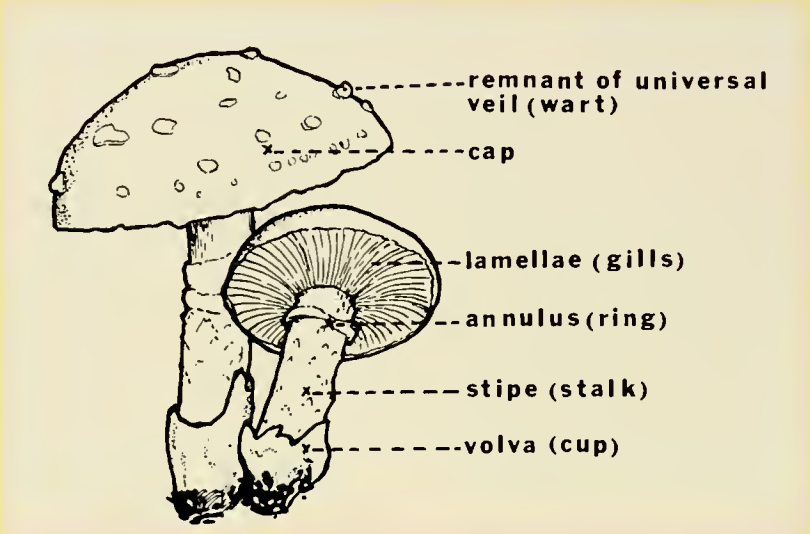
Never assume all mushrooms growing together are of the same species. Always check each plant for sharp color or marking differences. A variation in size can be expected, however. It should also be noted that certain species appear only near certain trees.

Take along a sharp knife, a trowel, tissue or wax paper, a few small containers for the more delicate specimens, several guide books and note paper for identification and description.

fairy rings

In earlier times people viewed a curious mushroom growth pattern (now called a fairy ring) with suspicion. It was thought fairies had danced in the woods during the night and the plants sprung up wherever their feet touched the ground.

A Dutch doctor of natural history, Jacob P. Thijsse, recorded the growth of one such ring from 1909-1911. The ring expanded year after year, forming concentric circles. In 1910 the Great Violet Rider fairy ring had grown to 154 by 144 inches with 153 specimens. The study is mentioned in *Mushrooms and Other Fungi* by H. Kleijn, and the author notes the ring had since grown to 218 by 208 inches.



poisoning

Persons interested in this new hobby should not be discouraged by sensational stories about toadstools, poisoning and hallucinations. Facts don't support the exaggerations. The number of toxic mushrooms represents only a small percentage of the total number of species.

As for the difference between a mushroom and a toadstool—there is none. The names can be used interchangeably although many people associate toadstools with poison. Centuries ago toads were believed to pass on their poisons by sitting on a mushroom. Or the word toadstool may have come from the German word, *Todestuhl*, meaning death stool.

No empirical test for good or bad mushrooms has ever been found, except positive identification before eating. The general health of a person may be an important consideration along with personal allergies. The toxins of some species attack the nervous system, some the internal organs. But abdominal cramps, nausea, diarrhea and vomiting are usually the first signs of poisoning.

If poisoning is suspected, call a doctor immediately. It could be an allergic reaction or actual poisoning. If the reaction occurs within six hours of the meal, or a doctor isn't immediately available, use first-aid methods to induce vomiting. Place an index finger into the victim's mouth and touch the back of his throat gently. This should cause the victim to gag and vomit. Turn his head to one side to prevent choking. Don't further irritate the intestines with more food or water.

Don't drink alcoholic beverages immediately before or after eating *Coprinus atramentarius* (inky cap mushrooms). The alcohol could combine with a substance in the plant to bring on an

—for safety's sake—

1. Pick one or two easily identifiable and tasty species such as morels, shaggy manes or puffballs and stick with them.
2. Never eat an unidentified mushroom.
3. When trying a new mushroom eat only small portions.
4. Get several good books and study the mushrooms in your area. Carry them with you in the field.

(left)—Mushroom hunting is by no means a physically demanding hobby. This "treasure" of wild mushrooms was spotted along a major Montana highway.
(below)—Early observers thought mushroom "fairy rings" were left by fairies as they danced in the woods at night. In reality, many mushrooms characteristically grow in this manner. (F&G photos by Roger Fliger)

increased heart beat with decreased blood pressure plus a violent headache, nausea, vomiting and dizziness.

Remember, poisoning from the Amanita group (page 21) is the worst and there isn't much a doctor or first-aid methods can do. Symptoms usually occur about 6-12 hours after the meal.

cooking hints

There are two methods of adding mushrooms to main dishes—include them during the last ten minutes of cooking or sauté and add before serving. (Wild mushrooms should never be baked in direct heat.) The plant can be used in almost any recipe if one of these two methods is used.

The plant is exceptionally high in riboflavin (vitamin B^2) and thiamine (vitamin B^1) and has a higher mineral content than most fruits and vegetables. Mushrooms contain only 66 calories per pound so they are great for calorie counters. And most dieters consider them more of a treat than a diet. Wine sauces, mushroom burgers and meatloaf and mushroom spaghetti sauce are all popular diet additions.

The stems of a mature plant will be tougher and will require a longer cooking period if they are used whole. These should be sautéed for 10 minutes; whole caps require a slightly shorter cooking period.

After returning from a mushroom hunt, trim stems, remove gross dirt and refrigerate the plants. Rinse under cold water when ready to use. Aluminum may change the color of the mushrooms so use stainless steel or enamelware cooking utensils.

Mushrooms contain about 70-90 per cent water and will shrink when cooked. Because they shrink, season mushrooms when the dish is ready to serve, not while the plants are being sautéed.

Inky caps and shaggy manes should be cooked soon after they are picked because they will turn into a black liquid through autodigestion if kept overnight in the refrigerator. If they are cooked first, they can be kept like other species.

Eat only small amounts of a new species because you may discover a hidden allergy. Since the plant is high in protein and can cause extreme indigestion from over-eating, use good judgment in portion sizes.

But before those wild mushrooms can be cooked, they must be found. Hunting doesn't require a degree in botany or biology. Anyone willing to give the idea some serious attention and a little study can easily become a "pothunter" . . . and a gourmet cook.

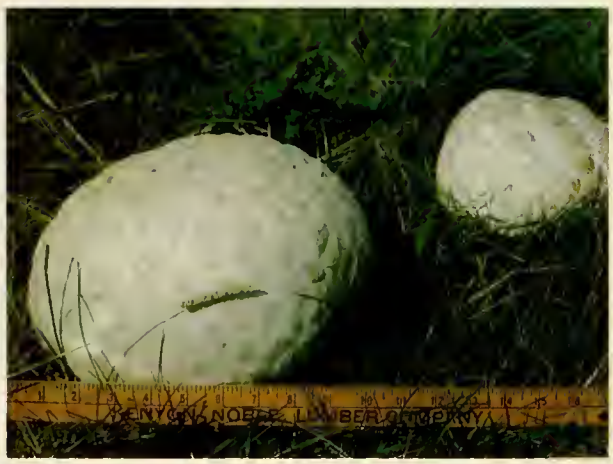
additional sources

The Savory Wild Mushroom by Margaret McKenny, *The Mushroom Hunters Field Guide* by Alexander H. Smith, *Mushrooms of Colorado* by Mary Wells and D. H. Mitchell, M. D. and *Mushrooms and Other Fungi* by H. Kleijn.

To Identify The

Morel (*Morchella* spp.) edible and cholce. Easily distinguished by sight. Cap varies from gray to tan or light yellow, stem white, cap and stem hollow. Found in spring along river bottoms under mature cottonwood stands, sometimes in burnt-over areas. Freezes and cans well, and is especially good in scrambled eggs.

Oyster mushroom (*Pleurotus ostreatus*) edible and good. White gills, always found growing from old cottonwood or alder logs, usually in clusters. Found in early spring and early fall or in summer during a wet, rainy season. If log picked up and taken home, placed in shade or in basement and watered frequently, fruits will continue to grow. Use only young, tender caps.



Giant puffball (*Calvatia gigantea*) edible and good. Large, solid white ball sometimes exceeding 12 inches in diameter found in open, rich soils in late summer or early fall during rainy, moist weather. Not easily confused with other species. Small plants should be cut in half to make sure they aren't button-stages of poisonous species. Slice and fry as you would eggplant. Discard any with discoloration inside.

Small puffball (*Lycoperdon perlatum*) edible. Rarely exceeds 2½ inches in height and 1 inch in diameter. Will eject puff of brown spores if squeezed when ripe. Found in late spring, summer and early fall during moist periods. Cut all specimens in half before using to make sure they aren't button-stage of deadly Amanita. Also discard any with discoloration inside.

Wild Mushroom

by Jim Ford

Meadow mushroom (*Agaricus campestris*) edible and choice. Creamy white cap, pink to brown gills. Always found in open meadows, lawns, golf courses, never found in woods. Species similar to commercial mushroom. Found in late summer and early fall, quite numerous after late summer rain on eastern Montana prairies. May be confused with the woodland mushroom (*Agaricus sylvicola*) found in woods and is nonedible.

Fairy ring (*Marasmius oreades*) edible and good. Common mushroom found on lawns, golf courses, pastures growing in a fairy ring in late spring or early summer. A pest to gardeners. Caps vary from pale buff to dull brown, rarely exceeding 3 inches in diameter. Never white. Gills are light tan to creamy white. This species dries easily and freezes well. Stems are tough and stringy.

Clustered Collybia (*Collybia acervata*) edible and good. Is found in clusters growing from the base of living trees, decaying logs or buried pieces of wood. Found in late summer and early fall in the moist coniferous woods of western Montana. Caps vary from honey color to light brown. Stems usually tough and stringy. Caps flatten with age.

Boletus (*Boletus* spp.) edible and good. Found in the fall in old coniferous forests throughout Montana. Caps tan to brown, sometimes moist and sticky, has pores on the underside instead of gills. Often picked up and stored in the forks of limbs and crotches of trees by squirrels. Avoid any species with red pores on the underside of the cap.

EDITOR'S NOTE: Because of the many species of mushrooms found in Montana and the surrounding region, it's quite impossible to picture all of them here. We've picked 15 of the most common mushrooms (12 edible and 3 poisonous) to feature in MONTANA OUTDOORS. To be absolutely certain of identification and to identify species not pictured here, we suggest referring to a more detailed mushroom guide. Several excellent books are listed on page 17. Special thanks to Dr. Mel Thornton and Wally Figiel of the University of Montana, Missoula, for technical advice on this feature.

Shaggy Mane (*Coprinus comatus*) **edible and good. Common, not easily confused with others. Found in early fall along edge of roads and in old logging roads. Use only young, white caps and stems. Discard any caps that are starting to turn dark—are overripe. Doesn't keep well fresh or frozen. Cans well.**

Inky Cap (*Coprinus atramentarius*) **edible. Similar to the shaggy mane but has a smooth cap; not as desirable or edible as shaggy mane. Deteriorates very fast, melts into a black mass. Has substance (disulfiram) that has varying and peculiar effects on people when mixed with alcohol.**

Purple Tricholoma (*Lepista nuda*) **edible and good. Quite common during fall in coniferous forests, easily recognized. Cap bluish to light purple, upturned and irregular with age, gills gray to light purple. This and related species should be used with caution, causes diarrhea and abdominal cramps in some people.**

Apricot Jelly mushroom (*Phlogiotis helvelloides*) **edible. Delicate, found in fall in moist areas under Douglas fir in western Montana. Grows on rotting wood and logs. Creamy white to light orange. May be eaten raw and in salads, pickled or candied.**

WATCH OUT FOR THESE THREE

—they can kill you—

(PHOTO BY GRANT HAIST) © NATIONAL GEOGRAPHIC SOCIETY

Destroying Angel (*Amanita verna*) **poisonous. White cap, white gills, white spores, bulbous base, found in hardwood or coniferous forests in summer and fall. Is deadly poisonous but not common to this area. Should be familiar with its appearance and characteristics and avoid anything with this appearance.**

Fly Amanita (*Amanita muscaria*) **poisonous. Pretty, cap varies from brilliant red to pale yellow, often with warts. Gills white and stem has buibous base. Found in coniferous forests or on edge of meadows surrounded by coniferous forests during spring, summer and early fall. Species got its name from practice of mixing with sugar and using as fly poison in Europe. Know its characteristics well and avoid it or anything similar.**

Emetic Russula (*Russula emetica*) **poisonous. Common and easily recognized. Pale to bright red cap and white gills, no warts on cap. Found in coniferous forests in late summer and fall. Can cause severe stomach cramps, diarrhea and vomiting.**

To Eat The Wild Mushroom

frozen mushrooms

Clean mushrooms. Cut up and simmer in butter or margarine until ¾ cooked (about eight minutes). Freeze in small containers the size of servings desired. To use, thaw and finish cooking. Use as fresh mushrooms.

dried mushrooms

Divide plants into pieces of suitable size. String on threads and suspend over a stove until bone-dry. Don't wash before drying. Before cooking, soak in water about one hour to restore. Use as fresh mushrooms. Dried mushrooms can also be pulverized and used as flavorings for soups and gravies.

mushroom burgers

½ lb. mushrooms, 1 lb. chopped beef.
Divide one pound of chopped beef into four patties. Divide each patty again to yield eight patties.
Slice the mushrooms on the large blade of the vegetable grater.
Make a sandwich with two meat patties and a mound of sliced mushrooms. Work the edges of meat together to make stuffed burgers. Broil or fry. This same procedure will make a meatloaf that is great for the calorie counter.

mushroom spaghetti sauce

½ lb. mushrooms, 1 clove garlic, 1 can tomato purée (10 oz.), 1 can tomato paste (6 oz.), 2 tbsps. olive oil, ½ tsp. oregano, ½ tsp. basil, ½ tsp. salt, ⅛ tsp. pepper, ½ tsp. sugar, ¼ cup water.
Slice the mushrooms. Mince the clove, then mash.
Put all the ingredients in a saucepan and mix. Bring to a quick boil and lower the heat. Gently simmer the sauce five or seven minutes.

sauteéd mushrooms

1 lb. mushrooms, 2 tbsp. butter, 1 tbsp. oil, salt and pepper.
Remove the stems from the mushrooms. Heat two tbsp. of butter and one tbsp. of oil over moderately high heat until it is bubbly and starts to spat. Don't allow it to brown.
Place stems in 12-inch skillet and sauté for five minutes. Add the mushroom caps round side down. Don't add more oil although the mushrooms will absorb most of it immediately. Shake pan.
After two minutes turn caps over and shake the skillet from time to time. Sauté for three more minutes.
Sprinkle with salt and pepper before serving. Don't cover if the mushrooms must wait for other food. A cover will cause a change in texture and the mushrooms will release their juice. If they must be rewarmed, heat for a minute. More oil is needed if mushroom slices are to be sauteéd. If the mushrooms are small the stems may be left on the caps but the pound should be cooked in two groups, using half the butter and oil each time.

mushroom omelettes

It is usually easier to make several little omelettes than to cope with one large one. As a general rule, use two medium mushrooms for each egg. The mushrooms should be sauteéd in a saucepan first.
To make the simplest two-egg mushroom omelette, slice four mushrooms and chop them. Sauté in one tablespoon of butter for five-ten minutes. Stir into the eggs and proceed with the omelette.
If the mushrooms are to be enfolded by the omelette, slice the mushrooms, don't chop, and then sauté. Add them after the eggs have become firm on the bottom but while they are still moist on the top. Fold the omelette and serve immediately.

marinated mushrooms

Marinated mushrooms can be served on lettuce leaves as a salad; sliced and used in a green salad; over a fresh vegetable salad with hard boiled eggs; in a cooked vegetable salad; in a chef salad or as a garnish for main-dish salads. They can be kept in the refrigerator for two weeks.
1 lb. mushrooms, ¼ cup olive oil, ½ cup corn oil, ¼ cup wine vinegar, 2 bay leaves, 1 tsp. chervil, ½ tsp. oregano, 1 tbsp. dry mustard, 1 tsp. salt, ¼ tsp. pepper, 2 tbsp. dry wine.
Place all the ingredients except mushrooms and wine in a large pot and bring to a boil. Add whole mushrooms, shake the pot and stir to be sure all mushrooms are moistened. Cover and cook over moderate heat for about ten minutes. Rinse a quart glass jar with very hot water and let drain. Remove the pot from heat and spoon mushrooms into the jar with a perforated spoon. Allow mushrooms to cool in the jar for one-half hour, uncovered. Let the marinade cool in the pot. Pour cooled marinade over the mushrooms, add wine, cover and refrigerate.

The Other Half

. . . A Woman's Look at Conservation by Cecelia Wittmayer

FIREPROOFING YOUR FAMILY

Some 3,000 people die each year after their clothing catches on fire. Another 150,000 are injured and an unusually high percentage are children.

These figures should sound a warning to the camping mother. A spark from a match, cigarette or campfire could easily ignite your child's clothing, or your own. Sport clothes aren't the only garments in danger from sparks, but outdoor living often leaves civilization, hospitals and doctors hours away.

The Flammable Fabrics Act of 1953 (public Law 88) is administered by the Federal Trade Commission (FTC) and applies specifically to wearing apparel. Flammable fabrics can not legally be exchanged in interstate commerce and a fine and imprisonment can be imposed on the fabric's manufacturer for unlawful trade.

The June, 1971 issue of CONSUMER REPORTS contains an article on 21 different adult sleeping bags. All the bags were rectangular and contained three pounds of synthetic-fiber filler. They were designed for summer use and cost between $15-$35.

The magazine tested and rated the individual bags and found that all but two, the Morsan Y01918 and Penney's Foremost No. 1142 Catalog No. 1481, could be ignited with a lighted match or cigarette. Their tests also showed a flame-retardant bag could be manufactured. (The Morsan model has since been discontinued and replaced with a similar model, Y0132. Both bags cost about $20.)

Some of the principal offenders of the Flammable Fabrics Act are brushed rayon in sweaters and children's wear, cotton chenille and cotton flannel, sweatshirts of 80 per cent cotton and 20 per cent viscose and fake fur coats of 65 per cent rayon and 35 per cent cotton. Another flammable combination is a fabric of 82 per cent acetate and 18 per cent nylon.

Of the natural fibers (silk, cotton, wool), wool is by far the least flammable. It is comparatively flame resistant in its natural state although it will catch fire. However, wool will not easily support combustion and the flame may go out by itself. Silk is not very flammable unless other fabrics are blended with it.

Nylon, polyester, acrylics and other synthetic blends are moderately flammable. But, the fabrics melt and drip when a fire starts and will stick to the skin causing more severe burns.

A few companies have fire-retardant garments for children on the market. More will probably be available soon.

The safest way to protect your camping family from accidental burns would be to make sure their sport clothes are made from flame-resistant materials. Since there are none on the market, the next best thing would be to study the fiber content of their sport garments and avoid particularly flammable combinations.

A textiles book, *Textiles: Origin to Usage* by Jules Labarthe, rated different fibers and fabrics according to their burning characteristics. Part of the chart has been reproduced below.

Fire Resistant Characteristics of Fabrics

(lowest numbers are most resistant to burning)
1—excellent 2—good 3—fair 4—poor

Fabric	Rating	Discussion
Glass	1	will not burn
Rayon	4	burns rapidly, supports combustion
Acetate	3	melts, supports combustion
Fortisan	4	burns rapidly, supports combustion
Nylon and Perlon	2	supports combustion with difficulty
Arnel	2	melts
Orlon	2-4	burns rapidly with sputtering
Dacron and Terylene	1-2	will not burn readily
Dynel	1	will not support combustion
Acrilan	2	burns with sputtering
Creslan	2	supports combustion
Vicara	2	supports combustion with difficulty
Cotton	4	burns rapidly, supports combustion
Wool	2	supports combustion with difficulty
Silk	2	supports combustion with difficulty

THE CATCHABLE TROUT

BY DICK VINCENT
as written by Don Bianchi
illustrated by Vern Craig

For decades fisheries workers and the fishing public believed the hatchery-reared catchable trout greatly increased the overall fishing opportunity. Now, a department study indicates the exact opposite is true.

EDITOR'S NOTE—The following article briefly states the results of a five-year study on the effects of stocking catchable trout (seven inches or longer) in wild trout streams. Researcher Dick Vincent has accumulated a massive file of facts and figures, most of which can't be presented here. His complete study will be published by the department in a separate, technical bulletin at a later date.

If someone told you good food, the American flag, motherhood, a clean environment and a healthy body were "bad" and shouldn't be defended, what would you do? Would you object? Laugh? Be angered? Accept it as a fact? Or just wonder?

Decide what you would do before you read further. On the following pages, this writer will take the polish off another "good, old American tradition" . . . the hatchery-reared catchable trout.

Carefully collected data has now demonstrated what many fisheries workers have suspected for decades—the catchable (seven inches and longer) trout planting program is "bad" for sections of a blue ribbon wild trout stream, the Madison River, and for one of its major tributaries.

These facts, in turn, suggest the entire national policy of stocking catchables in streams with thriving, wild trout populations is a waste of sportsmen's dollars and actually means fewer year-around fishing opportunities for the angler.

the fisheries program

In 1907, the State of Montana constructed its first fish hatchery. The public demanded it because they thought fish stocking was the key to a fishing paradise. Through the years, the belief has lingered and grown. Montana has 10 fish hatcheries now. Seven belong to the Montana Fish and Game Department. The U.S. Bureau of Sport Fisheries and Wildlife operates three, one of which (in Bozeman) has changed its emphasis to fish culture research instead of fish planting.

The department spends nearly $500,000 annually to operate its seven hatcheries. The remainder of the fisheries division's $1-1.2 million annual budget supports the management section. This section surveys lakes and streams to determine fisheries potential, researches fish management problems, tests water quality and maintains fish habitat. In short, this section manages Montana's fisheries resource.

Both sections—hatcheries and management—are funded by sportsmen's dollars. Approximately one-half of the management section's budget (about $250,000) is matched with federal funds (one Montana license dollar brings three federal dollars). On the other hand, the hatchery

section is funded entirely by sportsmen's dollars because federal matching money is not available.

the problem

For years, biologists and hatchery men thought the stream stocking programs were justified but knew they needed improvement. In the late forties, they discovered that 2-4 inch trout (fingerlings) planted in a wild trout stream rarely lived long enough to grow to catchable size.

To correct this, Montana and other states began to raise catchable trout for stream stocking. Although it was a more expensive program, fisheries workers theorized that anglers would quickly catch these larger fish and a longer life span wouldn't be necessary. By the early 1960's this program expanded to stocking catchable trout in nearly every Montana stream. During the highest production year, nearly three million catchable trout were planted in Montana waters.

But biologists found even catchables were not the answer. In most cases, 70 per cent died within four weeks when planted in wild trout streams. In three months, 95 per cent or more died. And, at best, fishermen usually caught only 40 per cent of the catchables and often creeled less than 15 per cent.

Even local fishermen began to question the catchable program. On Feb. 29, 1960 Dick McGuire of Ennis wrote to the Montana Fish and Game Department:

> *" . . . In the last several years legal-sized trout have been planted extensively in the Upper Madison . . . I never found it difficult to catch . . . fish . . . until the program started. There were plenty of fish in excess of two pounds that were not difficult to catch and at present they are almost a thing of the past . . . It is unusual that anyone catches a fish now that is not clearly a planted fish and only eight or nine inches at that . . . The hatchery fish were dumped into the river and the fishing became fabulous but just for a short time . . . Fishing pressure alone could not reduce it to its present state . . . My experience . . . leaves only one reason for the poor fishing . . . the planting program."*

Montana's present catchable program involves less than one million trout. The program

Each hatchery-reared catchable trout caught by an angler in the Upper Madison River costs about $2.50.

CATCHABLE TROUT continued

continues even though it's very expensive because —to cite a common justification—"that's what the people want and it isn't hurting anything."

Now fisheries workers know it is hurting something. *Although the catchable program does, in essence, put more fish in the angler's creel, it does so by decreasing the number of more desirable, wild trout in the stream and the creel, reducing the total pounds of fish taken and cutting down the average size of the creeled trout.*

the study

In the mid 1960's it was discovered that low-water flows during the winter greatly reduced trout numbers in the Madison River. Montana Power Company stored water in Hebgen Dam during the winter and caused below-normal flows in the Madison River below the dam. In 1967 the company agreed to change the water storage procedure, and since then the flow has been excellent for fish life.

To evaluate changes in the trout population with good water flows, the department established two study sections on the Madison River. The Norris section, located nine miles north of Ennis Lake, covered four miles of the blue ribbon trout stream. The Varney Bridge section, 10 miles south of Ennis, covered five miles of river. Biologists used electrofishing equipment to obtain trout population estimates. The electrical current stuns the fish so they can be collected, marked and returned to the river. Several days later biologists "shock" the same stretch of river and estimate trout populations from the ratio of marked to unmarked fish. Estimates were only made on trout seven inches or longer.

THE NORRIS SECTION

time	trout population estimate	remarks
spring, 1967	6,800	first spring estimate
spring, 1968	9,800	44% increase
spring, 1969	11,800	74% increase

conclusion: The population increased very satisfactorily with excellent water flows.

Researchers use electro-shocking equipment to collect fish from the Madison River.

THE VARNEY BRIDGE SECTION

time	trout population estimate	remarks
fall, 1967	1,600	first estimate
fall, 1968	1,500	6% decrease
fall, 1969	1,400	13% decrease

conclusion: The population decreased despite excellent water flows.

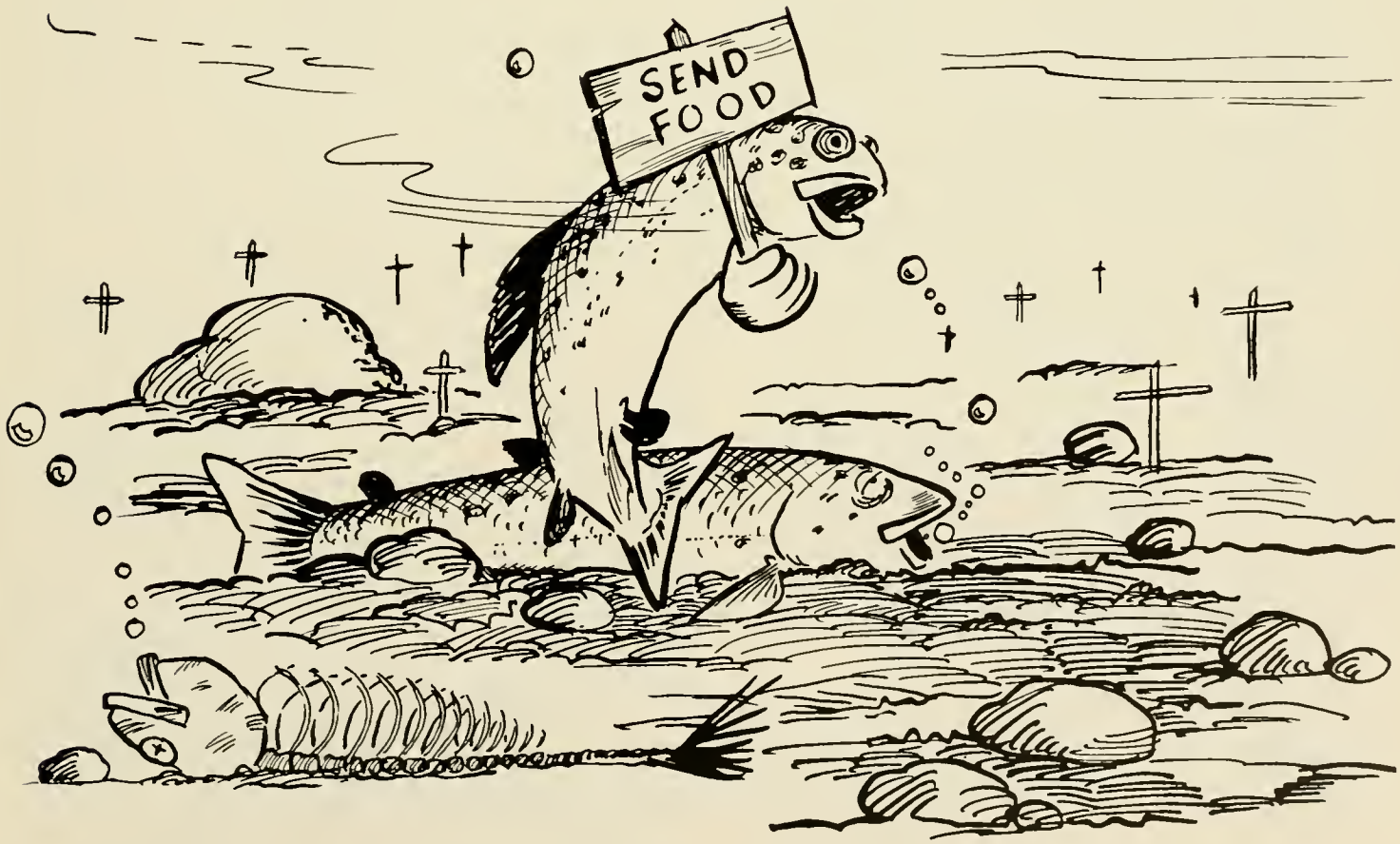
The lack of population growth in the Varney Bridge section puzzled fisheries workers. The Varney Bridge section was open to fishing only during the regular season and had boat floating restrictions. The Norris section remained open all year with no boating restrictions. The only other difference between the two was that the Varney Bridge section had been stocked with catchable trout every year since the mid 1950's. The Norris section had not been stocked with any fish since 1960. *Or, in short, the section of the Madison River with no fish planting and the fewest fishing restrictions had the greatest trout population growth.*

The study on the Madison River was continued and extended to one of its tributaries, O'Dell Creek. After the summer of 1970 the department stopped planting catchable trout in the Varney Bridge section. That spring 4,000 catchable trout were put in a 1.8-mile section of O'Dell Creek that had not been stocked since 1963. In the spring of 1971, another 4,500 were added. A one-mile section on O'Dell Creek was also established as a control area (an unplanted section of the stream).

Here's what happened:

EDITOR'S NOTE: Richard Vincent, 31, is a Fish Management Biologist for the department in Bozeman. Vincent earned a Bachelor of Science and a Master of Science degree in fish and wildlife management from Montana State University, Bozeman. The Montana native has been with the department since 1966.

Don Bianchi is a District Information Officer for the department's Information and Education Division. Bianchi, 34, has worked as Fisheries Biologist at Red Lodge and as District Fish Manager at Miles City. He holds Bachelor of Science and Master of Science degrees in fish and wildlife management from Montana State University, Bozeman. He is also an active member of the American Fisheries Society.



When planted in the Madison River, 95 per cent of the catchables usually die in the first three months. (Fifteen per cent end up in the angler's creel and 80 per cent die of natural causes.)

CATCHABLE TROUT continued

THE VARNEY BRIDGE SECTION

time	trout population estimate	remarks
fall, 1967-69 average	1,500	first estimates
fall, 1970	2,800	87% increase from average
fall, 1971	4,200	180% increase from average

conclusion: After trout planting stopped in the summer of 1969, the trout population nearly tripled.

O'DELL CREEK

time	trout population estimate	remarks
fall, 1967-69 average	640	first estimate
fall, 1970	700	little change
fall, 1971	330	49% decrease from average

conclusion: The populations remained stable until catchables were stocked in 1970-71. After the plant, trout numbers decreased 49 per cent.

In the control (unplanted) section of O'Dell Creek the trout population remained static, numbering 340 in 1970 and 370 in 1971.

The preceding data clarifies three important points: 1) *Trout numbers nearly tripled in the Varney Bridge Section when catchable planting stopped.* 2) *Trout numbers dropped by one-half in the section of O'Dell Creek planted with catchables.* 3) *No significant changes occurred in the nonstocked, control section.*

In addition to the overall trout population, the number of large fish (17 inches or longer and more than two pounds) decreased under catchable planting.

THE VARNEY BRIDGE SECTION

time	population estimate of large trout*	remarks
fall, 1967-69 average	218	first estimates (catchable plants stopped after summer of 1969)
fall, 1970	521	139% increase from average
fall, 1971	756	247% increase from average

* for trout 17 inches or longer

conclusion: The number of large trout more than tripled two years after catchable planting was stopped.

O'DELL CREEK

time	population estimate of large trout*	remarks
fall, 1967-69 average	63	first estimates (catchables were planted in spring)
fall, 1970	51	19% degrease from average
fall, 1971	26	59% decrease from average

* for trout 17 inches or longer

conclusion: The number of large trout dropped to less than one-half its original size after catchables were stocked.

what does it all mean?

The evidence was quite clear. The trout population more than doubled and "big fish" numbers more than tripled when catchable planting stopped in the Varney Bridge section. In O'Dell Creek, the trout population and the number of "big fish" decreased by nearly one-half when catchables were stocked.

But why?

Biologists studied the data and developed a theory explaining the drastic trout population changes.

Hatchery trout live an unnatural life, crowded in tanks, raceways and troughs and are artificially fed. They tolerate and survive these conditions but can't establish territories because of crowding.

Wild trout, on the other hand, know a completely different life. They establish territories (homes) and feed, rest and live in harmony with their wild environment. Generally, they protect and defend their territory from other fish and won't tolerate crowding.

Hoping to improve fishing, man plants hatchery-reared catchable trout in a stream supporting a wild fish population. After stocking, the stream has several hatchery fish in an area that formerly supported only one wild fish. Not able to tolerate these crowded conditions, some wild trout give up and leave.

By planting catchables, man disturbed the wild trout's harmony with its environment and rendered it homeless. The displaced wild trout's chance for survival is now practically zero.

And life is also different for the hatchery fish. It isn't fed several times a day and must face problems and perils common to the wild fish but new to the hatchery product. This is like turning a pet milk cow out with a herd of wild elk and expecting her to live. Hatchery fish face the same odds, and in most plants, 70 per cent die within four weeks. In three months, 95 per cent are gone. So, now, the wild trout population is reduced and the hatchery fish disappear, resulting in fewer fishing opportunities on a year-around basis.

economics

Since 1960, a total of 665,400 catchable hatchery trout, averaging 11 inches, were put into the upper Madison River. According to 1966 figures from five Montana fish hatcheries, it costs slightly more than 40¢ to raise an 11-inch trout. This figure represents only actual production costs and doesn't include such items as the initial cost of hatchery construction. Using the 40¢ figure, $266,160 has been spent to plant the upper Madi-

son River since 1960. Tag returns show that fishermen caught about 15 per cent of the planted fish. *At this return rate, the hatchery trout reaching the fishermen cost $2.67 per fish.* Inflationary prices have probably pushed this figure even higher today. *Without considering any other undesirable effects, this particular catchable program is purely poor economics.*

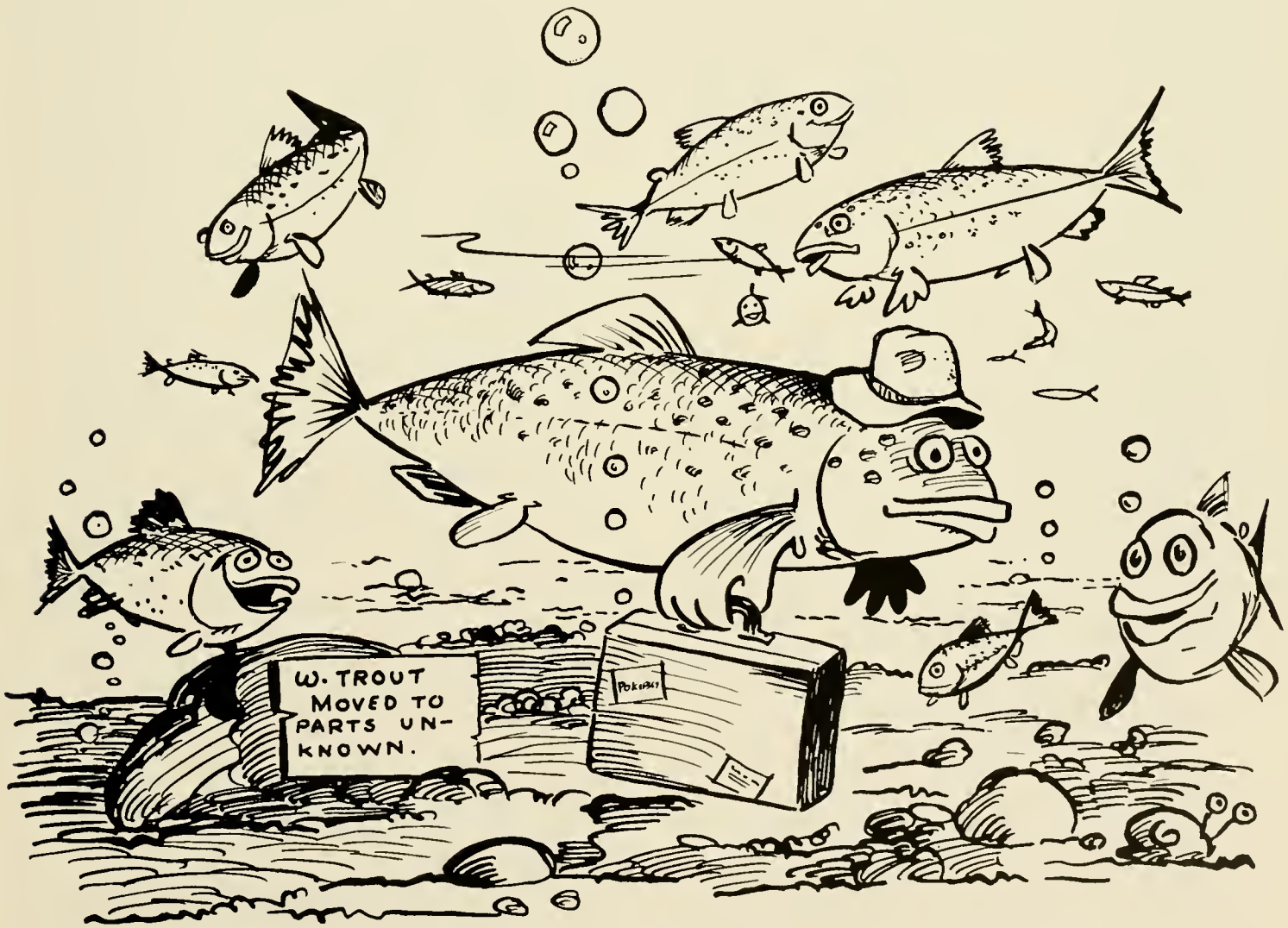
Even though most catchables planted in the Madison came from a federal fish hatchery at Ennis and were not paid for directly by Montana license dollars, the program still deserves economic criticism. The U.S. Treasury would also be hard-pressed to justify the expense.

It has been theorized that the catchable program gives the novice fisherman a better chance to catch fish. However, figures collected on another blue ribbon trout stream, Rock Creek, proved that this "better chance" applies to only 6 per cent of the anglers. When catchables were stocked, only 6 per cent of the fishermen who couldn't catch a wild trout were able to catch a trout.

Through the years, fish planting in Montana has received widespread public support. This support generally prevails today, but few consider the possibility of ill effects on wild trout populations.

Information collected from the Madison River and O'Dell Creek suggests that substantial plants of catchable hatchery trout are detrimental to wild trout populations. Additional data will be gathered this spring. If this conclusion holds true, the entire catchable trout program will be critically re-evaluated.

The economics of Montana's catchable program provide ample ground for serious criticism. But whenever catchable planting also degrades the wild trout population, such stocking should be discontinued.



The crowded conditions caused by planting catchables often drive wild trout from their established territories.

BOATING SAFETY 1972

NEW REGULATIONS EVERY BOATER SHOULD KNOW · BY BILL MCKIERNAN

In the last three years, Montana has had a rash of drownings. The Treasure State ranks relatively low in the number of boaters compared to other states, but ranks very high in percentage of boating fatalities. Only four states have fewer boats than Montana, but 18 states had fewer boating fatalities in 1970. When one realizes that many of these states have coastal waters and much more hazardous boating, the statistics become even more grim.

In 1970, 15 boating recreationists lost their lives on Montana waters, and property damage was more than $10,000. Eight nonfatal injuries were reported, two of them serious. Of the 15 fatalities, only four were nonresidents, so in most cases unfamiliar water and weather conditions were not to blame. Carelessness contributed to every boating accident in Montana in 1970, which means each could have been prevented if good judgment and common sense had been used.

The 1970 national statistics aren't much better. Reports on the 1,418 boating fatalities indicate more than 20 per cent of the vessels involved had no lifesaving equipment on board.

the new law

On Aug. 10, 1971, President Nixon signed the "Federal Boat Safety Act of 1971." Hopefully, the law will improve boating safety and foster greater development, use and enjoyment of all U.S. waters.

The act encourages state, industrial and public participation in comprehensive boating safety programs. It requires manufacturers to build recreational boats in accordance with certain performance standards. And, it encourages greater state participation in safety programs by making federal funds available for enforcement and boating education programs.

The new boating safety bill also requires states to rewrite existing boating regulations to conform with the federal act. In sum, it will provide a coordinated, national boating safety program.

Under the new law the U.S. Coast Guard will set reasonable and necessary safety standards, one of which will require all boat manufacturers to attach capacity plates on every boat to outline the vessel's safe load.

Another standard covers personal flotation devices. A windbreaker-type jacket has received the U.S. Coast Guard's approval as a personal flotation device, but it is rather expensive. It is comfortable to wear, however, and should become popular. It has long been a problem to get people to *wear* a life preserver instead of stowing it somewhere to meet law requirements. This new jacket might solve that problem and save many lives.

Montana boat owners will be most affected by the law's section on registration and numbering. In the past, only boats powered by more than eight horsepower had to be registered. The new federal law establishes a nationwide numbering system for any boat propelled by machinery, regardless of horsepower. With this system boatmen can travel into other states with their equipment and still be in compliance with local regulations.

Boat manufacturers will be closely regulated and will have to meet strict safety standards and regulations under this law. Although operator negligence can never be eliminated by regulations, the manufacturing industry can reduce the number of accidents by upgrading its products and making vessels safer for novice boatmen. Proposed standards cover loading, power and flotation requirements. The manufacturer will also be required to notify all purchasers of any safety defect discovered in his product and to remedy the error.

The "termination of use" clause has caused some controversy. U.S. Coast Guard boarding officers can send a boat back to shore if its operation is deemed unsafe because of a lack of life preservers, fire extinguishers or other safety equipment. Many boatmen wonder if the clause is a violation of their rights and if its actual intent would be abused.

To encourage greater state participation in safety patrol and enforcement activities, federal assistance will be available to states with approved water safety programs. In Montana, game wardens enforce the boating laws. Because they lack manpower and funds, most safety enforcement has been carried out incidentally with limit and license checks. The new funds will supplement the state's enforcement program and more stringent enforcement should help decrease the number of boating fatalities.

EDITOR'S NOTE: Bill McKiernan is the Boat Safety Officer in the department's Enforcement Division. The 41-year-old Montana native received his Bachelor of Science degree in fish and wildlife management from Montana State University, Bozeman. He has worked for the department since 1962 and has been Game Warden in Butte and Baker and Warden Sergeant in Kalispell. McKiernan is a charter member of the Libby Flotilla of the Coast Guard Auxiliary.

education programs

In the past, Montana's boating education programs have gotten little response. Many Montana accidents could have been prevented if boat operators had taken time to learn and obey the "rules of the road" and the safety suggestions that are a major part of any boating course. Perhaps a cooperative effort of the Coast Guard Auxiliary (a civilian branch that promotes safety and education), U.S. Coast Guard and Montana Fish and Game Department will produce a comprehensive boating education program that will get public attention.

The department's law enforcement division has established a new boat safety section to supplement the federal law. Federal funds may be used for additional enforcement personnel for waters with the heaviest boating pressure. These men would work for boating safety, with emphasis on law enforcement and safety information. They would also patrol and enforce the state's campground regulations.

licensing

Since the enactment of the "Federal Boat Safety Act," the U.S. Coast Guard has said all boat operators should have to take a course in boating safety, pass an exam and be licensed like automobile drivers. The federal agency argues the boating public will not participate in the available education programs, so a mandatory course and license system is needed.

The U.S. Coast Guard has run into much opposition from boating enthusiasts on this point. The National Association of State Boating Administrators has been very outspoken in its criticism. Boating manufacturers and other boating organizations are also critical of the plan. These groups contend carelessness and lack of judgment, not lack of knowledge, cause most accidents, and high administrative costs wouldn't make the program worthwhile. They say it would add one more tax to an already over-taxed boating public.

In general, the new law is good, but it isn't the complete answer. Boatmen have long needed a watchdog on the manufacturers. Most boat manufacturers are honest, dedicated people, concerned with making a profit and manufacturing a safe product. But as in any industry, a few are only interested in profits. Now these people will have to improve their product or face litigation.

Some type of financial assistance for state enforcement and education programs was sorely needed. The department received no money for administering the old laws, and strong enforcement is essential to reduce the death toll on Montana's recreational waters.

BIGHORNS IN

Could a bighorn herd with probably the highest

THE BREAKS

by Larry C. Eichhorn and C. Robert Watts

In 1805, Lewis and Clark observed bighorn sheep in the Missouri River Breaks near the mouth of the Judith River in central Montana. In his journal, Clark noted, " . . . I saw great numbers of the bighorned animals, one of which I killed . . .". However, in less than 75 years, man reduced the native bighorn, *Ovis canadensis auduboni*, to near extinction.

The last known native bighorn was reported to have disappeared from the Billy Creek area around 1916.

In the early 1940's biologists began to talk of introducing Rocky Mountain bighorns, *Ovis canadensis canadensis*, to range once occupied by the native (also called Audubon or Badlands) bighorn. In 1947, Colorado provided 16 Rocky Mountain bighorns for release within a 328-acre, fenced area on Billy Creek in the Missouri River Breaks.

In 1951, the herd had grown to an estimated 54 and bighorns roamed on both sides of the fenced area. Following removal of the fence in 1952, the bighorns scattered over a wide area. Permit hunting seasons for ¾-curl rams opened for two years. Hunters bagged two in 1955 and none in 1956. A population decline became evident, and the bighorn disappeared by 1963.

The decline apparently coincided with the removal of the fence, but specific reasons for this population's failure are unknown. Undoubtedly, habitat deficiencies played an important role in the disappearance. Competition for forage, disease, cross-breeding with domestic sheep and social intolerance toward domestic sheep may have complicated the transplant bighorn's life and hurried along its demise.

In 1957, the Montana Fish and Game Department made a second re-establishment transplant in the Two Calf Creek area in northern Fergus County. Department personnel constructed a seven-foot fence around 1,400 acres on the Missouri River. Between 1958 and 1961, they released 43 Rocky Mountain bighorns, of Montana origin, within this enclosure.

The bighorn population increased slowly from the original 43 transplants. Lamb production was good in 1969 and the population increased to at least 51. The following year productivity was even better and a ratio of 79 lambs per 100 ewes survived the winter, boosting numbers to at least 63. This is probably the highest production and lamb survival rate on record for North American bighorns. Productivity remained good in 1971 and the population jumped to 90. However, the herd experienced high mortality during the 1971-72 winter.

Taking the failure of the earlier Rocky Mountain bighorn transplant into consideration, one might assume this bighorn cannot adapt to the Missouri River Breaks area. This may be so. On May 28, 1805, Clark wrote of the Audubon bighorn, " . . . I believe the bighorn have their young at a very early season, say in March, for they appear now to be half grown." If he actually saw young of that year, the lambing period of the bighorn native to the Missouri River Breaks was at least two months earlier than the average lambing period of the transplanted Rocky Mountain bighorn. The earlier lambing period for the native Audubon bighorn might have evolved because of some survival advantage that is lessened or absent in the May lambing period for the Rocky Mountain bighorn.

The fate of a bighorn sheep transplant in the Missouri River Breaks still appears doubtful. The large ram, Old Crooked Horn, was taken during the 1971-72 special permit season. In the last three seasons, 11 mature rams have been bagged by hunters. (photo by Larry Eichhorn)

birth rate and lamb survival in N.A. be doomed?

BIGHORNS continued

But biologists feel less basic factors regulate this bighorn population. The summer herds of ewes and lambs space themselves throughout the Two Calf area on both sides of the enclosure. However, older rams always summer outside the fenced area. During the summer most herds outside the enclosure

see related story, page 2

make contact with domestic sheep, a source of potentially dangerous disease for the bighorns. In addition, the bighorns have lungworms, a common disease among North America's bighorn populations. In the fall of 1971 all lambs and most adults had the cough characteristic of severe lungworm infection, but the disease's effect on the population is not clear.

With the onset of winter most herds return to the enclosure. Domestic livestock, primarily cattle, grazes the Two Calf area (except for the range inside the enclosure) from April through November but doesn't make uniform use of the entire range because of rough terrain and the distribution of water. Throughout the summer bighorn herds graze in areas missed or lightly grazed by livestock. By late summer cattle have overused drainage bottoms and the adjacent lower slopes, sources of potential winter range for bighorns. The bighorn must therefore return to the enclosure for winter forage.

Bighorns returning to the fenced enclosure must compete for forage with a large, underharvested deer herd. Continual overuse of available browse plants by deer has led to "hilining" (eating all the foliage from lower branches) of even such poor-quality forage as juniper and Douglas fir. The "hilined" condition indicates an overall depleted range. The bighorn must have browse plants for winter survival when grasses they prefer are gone or buried by winter snows.

Examination of bone marrow indicates many bighorns died of starvation during the 1971-72 winter. Cattle confined the bighorns to the enclosure, already over-browsed by deer. The fenced area could not feed the increased number of bighorns after heavy snow covered part of the remaining forage.

The survivors of the bighorn population should have an easier future. Pasture rotation of livestock in the Two Calf area should improve the over-used range. A proposed change in deer hunting boundaries would bring more hunter pressure into this portion of the Missouri River Breaks area and would help balance the deer with their food supply. If the bighorn population builds to near the limit of its food supply again, a reduction of the population by hunting female bighorns would be an alternative preferable to starvation.

EDITOR'S NOTE: Larry C. Eichhorn and C. Robert Watts are co-authors of this article. Eichhorn is a Natural Resource Specialist with the Bureau of Land Management in Lewistown. The 34-year-old Montana native received a Bachelor of Science degree in range and wildlife management from the University of Montana, Missoula in 1961. Watts is a Game Biologist with the department. He received a Bachelor of Science degree from the University of Montana, Missoula and a Master of Science degree from Pennsylvania State University, University Park. The 31-year-old Montana native received his Ph.D. from Utah State University, Logan in 1969.

wildlife shorts

The snowshoe hare changes color by shedding old fur and growing a new coat each spring and fall.

* * *

Bears gorge themselves during warmer months so they can survive their long winter sleep. For example, one male gained 92 pounds during 24 days in June and July.

Only two of the world's 3,000 species of lizards are poisonous—the gila monster and the Mexican beaded lizard.

* * *

Dolphins (porpoises), a well-known ocean mammal, used to be land animals. For some unknown reason they took to the seas about 60 million years ago.

* * *

White-tail fawns usually remain within 30 feet of their birth place for the first 25 days of life.

A walleyed pike is not a pike. It's a member of the perch family.

* * *

Of Montana's 80 species of fish, only 52 are native. Twenty-eight were introduced from other areas.

* * *

A Nevada pilot reported seeing a mallard flying at 21,000 feet.

* * *

Female field mice can breed at four weeks and produce litters of 5-9 offspring every three weeks.

Three mule deer in Medicine Rocks State Park. (F&G photo by Ron Holiday)

MEDICINE ROCKS STATE PARK

About 60 million years ago a wide river meandered through an area now known as Medicine Rocks State Park. It laid down layer after layer of sand that eventually turned into fragile sandstone. And then, thousands of years of wind and rain created the rock formations that now jut from the rolling plains.

Local legends say Indians considered the rocks sacred and did medicine dances there before hunts and wars. No evidence exists to support the oldtimers' claims although pottery and other Indian artifacts have been found among the formations.

The rock formations are very localized and visible in only a few places within a 10-mile radius of the park. The soil is fragile and erodes easily. Off-road vehicle use and initials carved and painted on the rock have speeded erosion and have destroyed thousands of years of nature's work. This abuse also spoils the park's natural setting and violates department regulations.

Early spring brings a profusion of wildflowers. Many small mammals make their homes in the park together with several species of birds and mule deer. The park has stands of pine trees, offering shady spots on summer days.

Carter County donated the land to the parks division of the State Highway Department in 1957. Responsibility for this area was assigned to the Fish and Game Department in 1965 when the Recreation and Parks Division was transferred from the highway department.

No major highway passes the park, but local people have picnics, a large number of nonresidents camp there each year and area schools have held cross-country races in the park.

Appropriations from the state's long-range building fund and the Bureau of Outdoor Recreation made $20,000 available for park development in 1967. The department used the money to rebuild parts of the interior road, to develop a small campground and to provide picnic facilities and restrooms. Maintenance money for this and all land-based state parks and monuments comes from the state's general fund—the only use of tax dollars by the Fish and Game Department.

For something off the beaten path, consider a trip to Montana's Medicine Rocks State Park. —*Ron Holiday*

Medicine Rocks State Park

Location and Notes

Medicine Rocks State Park lies about 24 miles south of Baker, Mont., off State Highway 7. The 320-acre park contains large, weirdly eroded sandstone formations. The park has camping and picnic sites with drinking water.

The Carter County Museum in Ekalaka, Mont., (featuring local fossils), the Long Pines area in the extreme southeastern corner of the state and excellent hunting are three other area attractions.

dear F&G

likes classroom conservation

I can't tell you how pleased I am to see your new feature "Classroom Conservation." But, I think it should be aimed more towards all Montanans, not just the youth.

According to my own observations, the average Montanan regards the ecology program as "kid stuff," a good way for the Boy Scouts to make a buck, nothing that personally affects them unless there's a Boy Scout in the family.

If only every Montanan could spend a month breathing this rancid California air, gazing up to grey skies, greeting their kids coming home from school coughing so badly they have to lay down, not knowing what town you're driving through because they all run together. If they could see and feel these things and realize they are seeing their future, Montana's future, they'd stop it now.

Sometime next summer stand out somewhere east of Great Falls and gaze towards the Little Belt Mountains. See that haze? That wasn't there 15 years ago. In 15 more years you won't be able to see them at all. And don't tell me that line about it coming from Salt Lake. You've got lots of excellent sources right there in your own back yard.

And please save those "tin" cans, even though they only bring $20 a ton. So many everyday items come in these containers, it is impossible to avoid them. This ecology business isn't to save money, it's to save people. The cans to avoid are the ones that are "tin" with aluminum tops. It is impossible to separate the two metals. It is trash in its purest form.

Today the population doubles every 30 years. Standing room only for our grandkids.

Mrs. Nancy Laird
La Verne, CA

girlhood listening

My children and I are interested in what we as Montanans and American citizens can do to help provide habitat protection and preservation of our wildlife.

I grew up on a small ranch in the foot hills south of the Tongue River.

It has been many years now since I spent the early carefree days of my girlhood listening and observing wildlife. I no longer sit quietly in the evenings and listen to the songs of the birds or coyote. I no longer pause in the day's work to watch a "pet flock" of partridges or ducks passing over. Living the city life is not as rewarding as one may think, at least for me it is not. I long for days and nights away from the hurry-hurry civilization. Here there's no sage and pine-scented breezes, no whisper of the pines in the distance in the evening song of nature. It would be a great loss if these and other enjoyments that wildlife provides for man are lost.

Eunice Hill
Miles City, MT

floridians like montana

I want to take this opportunity to say how much I appreciate receiving MONTANA OUTDOORS.

This may sound unusual from a person born and raised in Florida, but my family and I sure did enjoy our two years in Montana while I was stationed at Great Falls. The warmth and friendliness of the Montanans sure helped offset our first winter (1968-1969) there. I personally enjoyed working as a Hunter Safety Instructor for the Fish and Game Dept.

We are hoping the Air Force will reassign us to Great Falls again after this year of schooling is completed. However, if not, we will still have these fond memories of Montana.

Frederick A. Young
TSgt USAF
Keesler AFB, MI

save the beartooth

I have received and read with great interest your March/April issue of MONTANA OUTDOORS. Montana is very fortunate to have such an abundance of subject matter to insure a successful publication of this kind.

I have to agree with Ruth M. Koch that the Beartooth area should remain *as is* for future generations to enjoy. The way this country wastes the natural resources, the minerals in that area are not that urgently needed. I think the mining companies could probably make more mining the city dump sites rather than destroying the natural beauty of the country through mining.

Earl Hoke
Byron Center, MI

COAL, WATER and TOMORROW

During the past few months we have reviewed two reports describing a situation that is likely to change forever the face and character of southeastern Montana. They were the North Central Power (NCP) Study, prepared by the Bureau of Reclamation assisted by a group of midwestern utility corporations, and a report on coal development in eastern Montana, prepared by the Montana Environmental Quality Council.

Essentially, these reports deal with the magnitude of the power demand outside of Montana and the coal and water resources of eastern Montana that may ultimately be committed to meeting that demand. By far the most alarming was the NCP Study, which unquestionably assumes that energy demands of this nation will continue to double every ten years and that we must prepare to meet that demand. Some of the present frivolous and wasteful uses of electrical power were never discussed.

The price Montana is expected to pay for power to be used in the midwest may ultimately come from 770,000 acres of land mined on a 35-year installment basis and from 2.7 million acre-feet of water contributed annually from the rivers and streams we hold in high esteem.

The Environmental Quality Council report points out that this monumental development may bring more than 250,000 people into the state. Presently, 300,000 people live east of a line from the Sweetgrass Hills to the western boundary of Yellowstone National Park. Because of this influx of people, jobs and money, the Montana you and I know may be about to disappear before our very eyes.

Obviously Montana possesses incredibly wealthy coal and water resources that are going to be exploited to produce electrical energy for Minnesota, Iowa, Missouri, South Dakota and Nebraska. Current events indicate the Pacific Northwest may also need Montana's energy.

It can be further assumed the capital needed to develop these resources and consequently the profits to be gained from them are going to predominantly come from and go to interest groups outside of the State of Montana. Therefore, it behooves those interested in Montana's prosperity to carefully scrutinize the concept to which we are about to commit our state.

The NCP Study also points out Montana's reserves are considered adequate for only about 35 years of operation. In the perspective of 100 years, the most shortsighted action we could allow would be to burn our coal in inefficient generating plants to be consumed as electricity in the midwestern United States.

The inefficiency of the projected power plants is well documented in the NCP Study, where it is stated, "For example magnetohydrodynamics holds the promise of converting coal and lignite to electrical energy with efficiencies approximating 60 percent, compared to efficiencies of present technology of about 30 to 35 percent."

My point is to urge that Montana doesn't blindly commit its valuable coal fields to an immediate and present demand for electrical power. Burning coal at 30 per cent efficiency may rob future generations of resource development options not yet dreamed of.

Both reports contain many other items too lengthy to discuss in this column, not the least of which will be stack emissions. Still not totally understood, these emissions may eventually blanket the southeastern part of our state with polluted air.

I merely urge that all concerned Montanans obtain and study these reports and then come to their own conclusions. From our particular point of view, the fish and wildlife resource could lose 770,000 acres of excellent habitat and 2.7 million acre-feet of water.

It is certainly not too early to begin thinking of the impact this development will have on the fish and wildlife resource of southeastern Montana and the aquatic ecology of both the Yellowstone and Missouri rivers.

Don L. Brown

Don L. Brown

A LIVABLE ENVIRONMENT FOR WILDLIFE IS A QUALITY ENVIRONMENT FOR MAN